



# A Detailed Description of Tumor Thrombus

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## DESCRIPTION

Venous Thromboembolism (VTE) includes a series of disorders associated with thrombosis in the venous circulation: Deep Vein Thrombosis (DVT) and Pulmonary Thrombosis (PE). The incidence of thrombosis is significantly increased in patients with malignant tumors due to hypercoagulability. In addition to the increased risk of thrombus formation in patients with malignant tumors, certain tumors are prone to intravascular dilation called tumor thrombi. Tumor thrombi are defined as tumors that spread to blood vessels, usually veins. It occurs in various malignant diseases. It is important to distinguish between neoplastic thrombi and “non-irritating” thrombi (lacking neoplastic cells) in relation to neoplasm formation. This is because it often affects staging and treatment approaches. The presence of tumor thrombi can significantly worsen prognosis, alter staging, and affect treatment options for these patients. Tumor thrombosis can have significant consequences for patients, but the clinical course and optimal management of tumor thrombi remains unclear.

## Pathology

Tumor thrombosis is usually composed of soft tissue and thrombotic components.

## Etiology

Tumor thrombi are probably most commonly associated with renal cell carcinoma, where the tumor can invade the renal veins and grow caudally to the right atrium. However, this phenomenon is not limited to renal cell carcinoma, but is recognized in hepatocellular carcinoma, Wilms tumor, adrenocortical carcinoma, retroperitoneal tumor, and transitional cell carcinoma of the renal pelvis (rarely). X-ray function

## Ultrasound

Contrast-enhanced ultrasound has been reported to be 100% sensitive and specific. The main feature of portal vein tumor thrombus is the presence of augmentation or color Doppler flow within the thrombus.

## CT/MRI

Diagnostic imaging features consistent with tumor thrombi on contrast-enhanced CT and MRI include the presence of contrast

agents, the most specific signs, the appearance of vasodilation, and limited diffusion. Angiography

The striped and thread-like appearance of tumor thrombi due to the parallel contrast of small blood vessels and arteriovenous shunts is characteristic of angiography.

## Nuclear medicine

Increased activity associated with the presence of thrombi in CT3

## TREATMENT AND PROGNOSIS

Complete surgical resection of parenchymal tumors and tumor thrombi results in a 5-year survival rate of over 50%. Incomplete tumor resection reduces the 5-year survival rate to about 10%. In the presence of known metastatic disease, surgical tumor weight loss not only improves symptoms, but may also prolong survival, especially if targeted chemotherapy continues. Surgery becomes more complex, and the more blood clots in the tumor, the higher the morbidity and mortality. Prior to surgery, patients should be anesthetized and/or cardiac to assess whether the patient is a suitable candidate for surgery given the relatively high perioperative morbidity and mortality must be evaluated. Interdisciplinary discussion between urology, vascular surgery, and cardiothoracic surgery may be required to determine the optimal surgical approach, depending on the extent of the tumor and/or the need for vascular reconstruction.

Anticoagulant therapy should be considered if there is a mild thrombus in addition to the tumor thrombus. However, avoid placing IVC filters. The presence of IVC filters can turn difficult operations into almost impossible ones. The presence of an adrenal filter makes it difficult to obtain better control during surgery than a tumor thrombus. Tumor thrombi can also be incorporated into the filter, making it very difficult to remove both the filter and the tumor thrombus. Traditional neoadjuvant chemotherapy and radiation therapy are ineffective against RCC. Small studies of targeted therapies (sorafenib, erlotinib, temsirolimus, etc.) have shown the ability to reduce tumor thrombotic levels and make subsequent surgery safer and easier. Further research is needed to determine if these targeted neoadjuvant chemotherapeutic agents should be recommended in the case of tumor thrombi. Preoperative transarterial embolization may be performed. It

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reduces bleeding and surgical time due to surgery, but has not been shown to improve overall survival. Therefore, its role and usage are explained. Centralized control of tumor thrombi must be achieved to prevent tumor thrombi from embolizing the lungs during surgery.

The approach to achieving centralized control depends on the extent of the spread of the intravascular tumor. For stage 0 tumor thrombi, the renal vein is ligated to the center of the tumor thrombus and a mass nephrectomy is performed. Stage I tumor thrombi do not require IVC clamps or controls. Tumor thrombi are milked into the renal veins while removing the kidneys at the same time. Next, the renal veins are ligated and the nephrectomy is completed in a batch. Surgery for stage II tumor thrombosis is more complicated. Tumor thrombi that extend more than 2 cm into the IVC cannot be milked into the renal veins.

To control the IVC cranial side of the tumor thrombus, the liver is mobilized by ligating the accessory hepatic vein that drains the caudal lobe. Next, the intrahepatic IVC below the level of the hepatic vein is clamped. In addition, inflow control is required. Both the subrenal IVC and the contralateral renal vein should be clamped. Fortunately, the hepatic veins supply about one-third of the IVC flow, so stage II thrombi do not require cardiopulmonary or venous bypass. Therefore, proper venous return can be maintained. After proper proximal and distal control is achieved, an L-shaped vena cava incision is made and extends into the affected renal vein. This incision removes the blood clot in the tumor from the IVC. The kidney and the rest of the tumor thrombus are removed together.